This key should allow you to understand why you choose the option you did (beyond just getting a question right or wrong). More instructions on how to use this key can be found here.

If you have a suggestion to make the keys better, please fill out the short survey here.

Note: This key is auto-generated and may contain issues and/or errors. The keys are reviewed after each exam to ensure grading is done accurately. If there are issues (like duplicate options), they are noted in the offline gradebook. The keys are a work-in-progress to give students as many resources to improve as possible.

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1. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

   More than 9 units from the number -1.

   The solution is $(-\infty, -10) \cup (8, \infty)$, which is option B.

   A. $[-10, 8]$

   This describes the values no more than 9 from -1

   B. $(-\infty, -10) \cup (8, \infty)$

   This describes the values more than 9 from -1

   C. $(-10, 8)$

   This describes the values less than 9 from -1

   D. $(-\infty, -10] \cup [8, \infty)$

   This describes the values no less than 9 from -1

   E. None of the above

   You likely thought the values in the interval were not correct.

   General Comment: When thinking about this language, it helps to draw a number line and try points.

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2. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

   More than 5 units from the number 7.

   The solution is None of the above, which is option E.

   A. $(-\infty, -2] \cup [12, \infty)$

   This describes the values no less than 7 from 5

   B. $(-2, 12)$

   This describes the values less than 7 from 5

   C. $(-\infty, -2) \cup (12, \infty)$

   This describes the values more than 7 from 5

   D. $[-2, 12]$

   This describes the values no more than 7 from 5

   E. None of the above

   Options A-D described the values [more/less than] 7 units from 5, which is the reverse of what the question asked.

General Comment: When thinking about this language, it helps to draw a number line and try points.

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3. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-8 - 6x < \frac{-28x - 9}{5} \leq -7 - 7x$$

The solution is None of the above., which is option E.

A. $[a, b)$, where $a \in [14.25, 21]$ and $b \in [1.5, 5.25]$

$[15.50, 3.71)$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

B. $(-\infty, a) \cup [b, \infty)$, where $a \in [13.5, 21]$ and $b \in [2.25, 5.25]$

$(-\infty, 15.50) \cup [3.71, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

C. $(a, b]$, where $a \in [12, 18.75]$ and $b \in [3, 6.75]$

$(15.50, 3.71]$, which is the correct interval but negatives of the actual endpoints.

D. $(-\infty, a] \cup (b, \infty)$, where $a \in [12.75, 18]$ and $b \in [-0.75, 11.25]$

$(-\infty, 15.50] \cup (3.71, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

E. None of the above.

* This is correct as the answer should be $(-15.50, -3.71]$.

General Comment: To solve, you will need to break up the compound inequality into two inequalities. Be sure to keep track of the inequality! It may be best to draw a number line and graph your solution.

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4. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-4 - 3x \leq \frac{-7x - 3}{4} < 6 - 8x$$

The solution is None of the above., which is option E.

A. $[a, b)$, where $a \in [-2.25, 3.75]$ and $b \in [-2.62, -0.97]$

$[2.60, -1.08)$, which is the correct interval but negatives of the actual endpoints.

B. $(a, b]$, where $a \in [1.5, 5.25]$ and $b \in [-4.5, 0]$

$(2.60, -1.08]$, which corresponds to flipping the inequality and getting negatives of the actual endpoints.

C. $(-\infty, a) \cup [b, \infty)$, where $a \in [0.75, 6]$ and $b \in [-2.32, -0.82]$

$(-\infty, 2.60) \cup [-1.08, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality AND getting negatives of the actual endpoints.

D. $(-\infty, a] \cup (b, \infty)$, where $a \in [0, 7.5]$ and $b \in [-1.57, -0.53]$

$(-\infty, 2.60] \cup (-1.08, \infty)$, which corresponds to displaying the and-inequality as an or-inequality and getting negatives of the actual endpoints.

E. None of the above.

* This is correct as the answer should be $[-2.60, 1.08)$.

General Comment: To solve, you will need to break up the compound inequality into two inequalities. Be sure to keep track of the inequality! It may be best to draw a number line and graph your solution.

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5. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-8 + 3x > 4x \text{ or } -3 + 7x < 9x$$

The solution is $(-\infty, -8.0)$ or $(-1.5, \infty)$, which is option D.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-9.75, -7.5]$ and $b \in [-3.75, -0.75]$

Corresponds to including the endpoints (when they should be excluded).

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [0.75, 2.25]$ and $b \in [6, 12]$

Corresponds to inverting the inequality and negating the solution.

C. $(-\infty, a] \cup [b, \infty)$, where $a \in [0, 2.25]$ and $b \in [5.25, 11.25]$

Corresponds to including the endpoints AND negating.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-12.75, -4.5]$ and $b \in [-3.75, 0]$

* Correct option.

E. $(-\infty, \infty)$

Corresponds to the variable canceling, which does not happen in this instance.

General Comment: When multiplying or dividing by a negative, flip the sign.

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6. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{-9}{2} - \frac{9}{6}x \leq \frac{-5}{7}x + \frac{3}{4}$$

The solution is $[-6.682, \infty)$, which is option C.

A. $[a, \infty)$, where $a \in [4.5, 7.5]$

$[6.682, \infty)$, which corresponds to negating the endpoint of the solution.

B. $(-\infty, a]$, where $a \in [-8.25, -0.75]$

$(-\infty, -6.682]$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

C. $[a, \infty)$, where $a \in [-8.25, -6]$

* $[-6.682, \infty)$, which is the correct option.

D. $(-\infty, a]$, where $a \in [6, 9]$

$(-\infty, 6.682]$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

7. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-5 + 7x > 8x \text{ or } 7 + 5x < 8x$$

The solution is $(-\infty, -5.0)$ or $(2.333, \infty)$, which is option C.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-3, -1.5]$ and $b \in [4.27, 6]$

Corresponds to including the endpoints AND negating.

B. $(-\infty, a] \cup [b, \infty)$, where $a \in [-8.25, -3.75]$ and $b \in [1.27, 4.42]$

Corresponds to including the endpoints (when they should be excluded).

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [-6, -3]$ and $b \in [-2.25, 3]$

* Correct option.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [-3, 0]$ and $b \in [3, 7.5]$

Corresponds to inverting the inequality and negating the solution.

E. $(-\infty, \infty)$

Corresponds to the variable canceling, which does not happen in this instance.

General Comment: When multiplying or dividing by a negative, flip the sign.

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8. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$4x - 10 \geq 7x + 5$$

The solution is $(-\infty, -5.0]$, which is option D.

A. $[a, \infty)$, where $a \in [2, 6]$

$[5.0, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

B. $(-\infty, a]$, where $a \in [1, 8]$

$(-\infty, 5.0]$, which corresponds to negating the endpoint of the solution.

C. $[a, \infty)$, where $a \in [-10, -4]$

$[-5.0, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

D. $(-\infty, a]$, where $a \in [-11, 0]$

* $(-\infty, -5.0]$, which is the correct option.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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9. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-9x - 7 > -4x + 7$$

The solution is $(-\infty, -2.8)$, which is option C.

A. $(-\infty, a)$, where $a \in [0.8, 5.8]$

$(-\infty, 2.8)$, which corresponds to negating the endpoint of the solution.

B. (a, ∞), where $a \in [2.8, 3.8]$

$(2.8, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

C. $(-\infty, a)$, where $a \in [-4.8, -1.8]$

* $(-\infty, -2.8)$, which is the correct option.

D. (a, ∞), where $a \in [-7.8, -1.8]$

$(-2.8, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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10. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{6}{8} + \frac{6}{4}x \leq \frac{8}{9}x - \frac{3}{5}$$

The solution is $(-\infty, -2.209]$, which is option B.

A. $(-\infty, a]$, where $a \in [1.5, 3]$

$(-\infty, 2.209]$, which corresponds to negating the endpoint of the solution.

B. $(-\infty, a]$, where $a \in [-4.5, -0.75]$

* $(-\infty, -2.209]$, which is the correct option.

C. $[a, \infty)$, where $a \in [0, 5.25]$

$[2.209, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

D. $[a, \infty)$, where $a \in [-3.75, 0]$

$[-2.209, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.